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PETROLEUM.

HOW OIL WELLS ARE SUNK.

HOW OIL FLOWS—THE BORING MACHINERY.

The Philadelphia *Petroleum Journal* gives an interesting account of the method in which oil wells are driven and worked, from which we extract the following particulars:

"OIL WITCHES."

In the selection of sites for the sinking of wells very much depends upon chance. There are, however, in many cases certain outward indications influencing the judgment of experienced operators, and not unfrequently these are of so marked a character as almost from the beginning to ensure success. There is no general rule that can be held as applicable in the selection of these sites.

There are those, however, who pretend to designate the precise points where wells may be sunk with the certainty of success; and many who would be unwilling to admit their faith in these charlatans, not unfrequently consult them and adopt the point designated by their divinations. There are two classes of these "oil witches," as they are called. One uses the "witch hazel," and sometimes the common maple; the other a new invention, called the "oil indicator."

The "oil indicator" is a metallic compound, the secret of which is with the inventor. It is egg-shaped, of the size of an ordinary musket ball, and suspended by a silken cord from two to three feet in length. It is claimed for it that deposits of petroleum at various points in the vicinity of where it may be held, will give it a circular motion, while in passing directly over such deposits it will become entirely still, thus marking particular points where wells may be sunk advantageously. As we have said, few are willing to admit their faith in these divinations, and yet these charlatans pick up many a stray greenback.

THE SINKING OR BORING MACHINERY.

In sinking a well, the site being fixed, the next step s the setting of the engine and the erection of the derrick. The engine should not be of less than ten horse power, and will cost from one thousand five hundred to one thousand eight hundred dollars. The derrick, consisting of four upright timbers forty-four feet in length, twelve feet apart at the base and about four at the top, is erected directly over the point selected for boring. Midway between the derrick and the engine a walking-beam is erected, one end of which enters the frame-work of the derrick to a point directly over the well. If the well is to be sunk on bottom land, as upon the flats on Oil Creek, some thirty or forty feet of heavy iron pipe, of seven or eight inches diameter and about four inches bore, are first driven into the earth by a powerful pile-driver erected within the derrick, and operated by the engine. The pipe is for the purpose of guiding the tools in boring, as well as to give security to the well through the softer formations of the surface, and the utmost care is requisite to give it precision.

If in driving this pipe a boulder or soft rock is encountered, the chisel is at once applied, the pipe cleaned by means of a sand pump, the boulder or rock bored, and the pipe driven through, the force used in driving being sufficient to crack the boulder, or in case of soft rock, to cause it to crumble beneath the pipe and fall into the chamber. If a heavy rock is encountered, which cannot be thus perforated, the pipe is cut off at the surface and driven no further. Ordinarily about three lengths of pipe, say thirty-six feet, are so driven. In some cases wooden pipes, about a foot in diameter, are substituted, the ends of each section being stoutly bound with iron; but the added trouble of driving more than counterbalances any saving that otherwise might result. In soil where these pipes cannot be driven, the earth is excavated to the depth of some ten or twelve feet, and a wooden pipe or board box, from four to six inches square, inserted, through which the boring is prosecuted.

The pipe being driven, the work of boring commences. The pile-driver is removed. A cable, about two inches in diameter and from five to six hundred feet in length, is wound upon a cylinder between the back timbers of the derrick, passing thence through a pulley in the top of the derrick, and down to the well. The tools consist first of two heavy rods of iron about fifteen feet in length and weighing from three hundred to three hundred and fifty pounds. One end of each of these rods is divided so as to form a link of about three feet in length, and the two being connected through these links have that much play, breaking the force of their fall in boring. A chisel of about fifty pounds weight, with a bit three inches in width, is attached to the lower rod, and to the upper a temper-screw three feet in length, by which the tools are paid out as the boring progresses. All these are securely fastened to the cable. A heavy rope or iron rod four or five feet in length, descending from the end of the walking-beam is also fastened to the cable immediately above the tools by means of a heavy clamp, the walking-beam is raised, and the apparatus is ready for work.

THE BORING PROCESS.

The tools rise and fall with the movement of the walking-beam, the person in charge of the boring occupy such a position as to have them under complete control, and so turning them at every descent, this way and that, that the chisel cuts a circular chamber of its full width, the temper-screw enabling him to pay out the tools untill they have sunk to the full depth of three feet. The tools are then withdrawn, a sand-pump about six feet in length is applied, and all the loose earth and gravel in the well removed. This process is repeated until the well has been sunk through the iron pipe. After each withdrawal of the tools a portion of the cable equal to the distance bored is paid out, and the same process again gone over. When the iron pipe has been passed, after each application of the sand-pump, a reamer is attached to the lower rod in place of the chisel, and being slightly larger than the latter, the boring is trimed so as to give to it a uniform and even surface. The work of boring, however, becomes more difficult as the well increases in depth, a longer time being required for drawing the tools, and also for pumping. Both the tools and the pump are raised by machinery—the former by winding up the cable upon its cylinder, and the latter by another cylinder for that special purpose, there being a similar rope attached to the pump, by means of which it is let down into the well. It generally requires four or five applications of the pump to clean out the well after the tools are withdrawn.

The time ordinarily consumed in boring a well is from eighty to one hundred days, the progress made being from three to ten feet per day in gravelly formation, and from one to three feet in rock. Contracts for sinking wells are made at three dollars per foot, engine and tools being provided; but wells of five hundred and fifty feet in depth, cost, at the present price of labor, not less than one thousand eight hundred or two thousand dollars, making the total cost of the well and fixtures about six thousand dollars. The cost of sinking wells, however, can be very greatly reduced, and the work performed in much less time, by the introduction of improved machinery; the rock drill, for instance. This drill is circular and hollow, and set with diamond-shaped teeth of hardened steel. It is connected by an iron rod to bevelled cogwheels, attached by cranks and rods to the walking-beam of the engine, and revolves rapidly, cutting its way down and leaving a central core standing, which, at intervals is cut off and taken out by a clamp. This core exhibits the stratification of the rock, and will settle some vexed questions of strata, not to be ascertained by the ordinary method of drilling.

It will be understood that in sinking wells they are constantly filled with water. The chief water courses are generally found between the surface and the first sand rock, which lies at a depth of about one hundred and twenty feet. This rock is from thirty to forty feet in thickness. A soft rocky formation of some hundred feet is then encountered, and, at a depth of three hundred and fifty feet, the second sand rock is found, about the same thickness as the first, after which comes a second soft, soapy rock, with other formations, until at a depth of five hundred or five hundred and fifty feet, the boring enters the third sand, which is a bluish, slaty formation, or shale, of from forty to sixty feet in thickness, and in the crevices of this oil and gas are found. It is seldom that much gas is found in Oil Creek wells above the third sand, but after entering the third sand, the evidences increase, and frequently the force of the gas is so great as to throw the water from the well to a distance of thirty and forty feet, much resembling the Iceland geysers, where steam is the motive power.

Ordinarily wells are sunk into the third sand from fifteen to thirty feet, but if a strong head of gas is encountered, the work is extremely difficult, the tools themselves being sometimes thrown from the well by the force of the gas, notwithstanding their immense weight. The presence of this gas affords unmistakable evidence of oil, even where the water thrown up is not manifestly impregnated with oil, as is mostly the case, and of a strong saline taste. If oil is found in the water, the well is at once regarded as a success, and further boring is relinquished.

THE TUBE AND "SEED-BAG."

The next step is to tube the well and prepare it for work. Until that is done, large quantities of water mixed with oil continue to be discharged by the force of the gas. The tubing consists of iron pipe two and half inches in diameter, in sections of about twenty feet, which are screwed together and put down in the well to within a few inches of the bottom. As yet, the water from the water-courses above the first sand rock

has been constantly running into the well, finding its way into the oil veins, and being heavier than the oil, forcing it to other localities. To check this flow of water, a seed-bag is fastened around that section of the tubing that is to take its place in the first sand rock and below the water-courses. The seed-bag is made of heavy cow hide, of a size, when filled, to fit the chamber of the well, and about eighteen inches in length Placed around the tubing at the point desired, the lower end of the bag is securely fastened by a strong cord; it is then filled with flaxseed, the upper end secured in like manner as the first, and the tubing progresses to completion, the seed-bag meantime being sunk to the position designed for it, where the action of the water causes the seed to swell so as to completely fill the chamber, and render any further descent of water into the well impossible.

It sometimes happens, in boring, that a water crevice is found below the first sand rock, in which case the seed-bag must be put down in the second sand rock, so as effectually to exclude all water from the oil strata. The work of tubing being completed, sucker-rods are inserted in the tubing and sunk to within a few inches of the bottom, a bucket being attached to the lower rod similar to that in an ordinary pump. These rods are of wood, an inch in diameter, twenty feet in length, the ends encased in iron sockets and fastened together by a screw. The tubing is then carefully secured in its place, the machinery for pumping adjusted and attached to the walking-beam, a goose neck and pipe arranged leading from the tubing to tanks constructed to receive the oil, and the well is ready for work.

WATER VS. OIL.

It becomes necessary in the first place to free the well from water, that up to the completion of the tubing had been running into it, and until this is done the character of the well cannot be determined. For this purpose the pump is at once set to work, and little else than water is yielded for a couple of days, and in some cases a week; at length, however, the water being exhausted, the oil returns, and is pumped into the tanks in greater or less quantities, according to the productiveness of the veins through which the boring has passed. Some wells produce not more than five barrels per day, others ten, twenty, thirty, fifty, one hundred and five hundred barrels. The opening of a well yielding only thirty barrels per day is regarded as a fortunate enterprise; but four hundred and six hundred barrel wells are not unfrequent, and the "Coquette" well, opened in November last, on the "Egbert" farm, yielding for a time eight hundred barrels, and has yielded three hundred and four hundred barrels per day throughout the winter. A thirty barrel well, with oil at ten dollars per barrel, will yield three hundred dollars per day, nine thousand dollars per month, and one hundred and eight thousand dollars per annum, if steadily productive.

Very often, after water has been pumped from a well, the evidences of a large supply of oil are such as to induce the drawing of the sucker rods, and thereafter the oil flows from the well in a steady stream, sometimes uninterruptedly, but generally after the first few months falling off, and rendering the application of the pump neccessary. The "Noble" well opened in May, 1863, and which has recently ceased, or is yielding but little, has flowed upwards of four hundred thousand barrels of oil, earning for its owners nearly three-quarter millions of dollars; the "Sherman," nearly oposite, and which failed some four months since, has yielded over three hundred thousand barrels; the "Maple Shade" nearly two hundred thousand barrels, and several others from fifty thousand to one hundred thousand barrels. In most cases, however, even flowing wells do not yield more than from two hundred to four hundred barrels per day, and for every one exceeding two hundred barrels there are a dozen yielding less, say from fifty to one hundred barrels.

The oil, as it comes from the well, whether pumping or flowing, is often mixed with large quantities of water, and the two run together into immense tanks of the capacity of from one hundred to five hundred barrels, where the oil rising to the surface, the water is drawn from the bottom of the tanks by means of a spiggot. The oil is also sold directly from the tanks, the purchasers in all cases providing the barrels, and incurring the cost of filling. Ordinarily there is but a limited stock of oil at the wells, it being bought up and forwarded to market as fast as produced; but during the winter, owing to bad roads and want of proper facilities for transportation, quite a large stock has accumulated that must await the resumption of river navigation.

THE POLYTECHNIC ASSOCIATION.

The Polytechnic Association of the American Institute held its regular werkly meeting, on Thursday evening, Feb. 9, 1865; the president, S. D. Tillman, Esq., being chairman.

Miscellaneous business being in order, Mr. J. K. Fisher read the following:—

PETROLEUM AS A STEAM FUEL.

"Mr. C. J. Richardson, C. E., has made experiments at Woollwich, the result of which the London Times states to be that one tun of petroleum is equal for steam purposes to five tuns of coal, and will occupy less room, and will require fewer stokers, and so on. Mr. B. H. Paul controverts this; he concludes that there cannot be a saving while petroleum is near its present price. Mr. Richardson replies, claiming that with petroleum at £17 per tun, and coal at 15s., and freight at £7 per tun, a return of £14, 15s. is made in favor of petroleum. The *Mechanics' Magazine* reviews the discussion, and concludes that Mr. Richardson has miscalculated—that it follows from his own data that the balance will be £2, 17s. per tun against petroleum; and it says that while the Woolwich authorities may possibly have good grounds for their alleged report in favor of petroleum as fuel for ships, it is certain that Mr. Richardson has not shown such grounds to the public. The report of the engineers appointed some months ago by our Navy Department was favorable to the view that petroleum may in some cases be used with advantage.

"When petroleum cost ten cents per gallon I proposed a plan for using it to aid the combustion of smoke in locomotives; I read a paper on it before this club, and published it in the Railway Review, which I then edited. But the price soon rose so high that it seemed to me that it would not be economical, and I therefore did not pursue the subject. But since the explanation of the geological relations of petroleum, by Dr. Stevens, it seems as if the price of it cannot remain high, and may be expected to decline until it can be used for steam fuel, at least in the cases referred to in the reports. In view of this probability, I propose the subject for the consideration of engineers and inventors, with the object of practically promoting it; and for this purpose I suggest an association of men who are willing to assign their individual improvements to the association, on condition that the profits shall be divided by arbitration after the merits of each person's contribution shall have been proved by trial,

"I will contribute a design. How much novelty or patentability there is in it I have not inquired; but whatever there is I intend to patent; and I now publish it for the purpose of obtaining inventive and engineering aid; and have no intention to abandon it to the public, at least until the public provides a foundling hospital for such abandoned inventions. What I mean is this: that if an invention is abandoned, it is as sure to die as an abandoned child would be if there were no charitable institutions and no private charity; and it is therefore the duty of an inventor to preserve the right which the patent laws confer upon him, so that if he finds a party willing and able to establish the invention, he may induce him to do so by assigning to him the patent-right.

"The method of combustion which I propose is an extension of what I published two years ago. It is to vaporize the petroleum in a boiler, under a pressure of about 150 lbs. per square inch. From the boiler it is to go to the furnace in pipes perforated with minute holes, and to blow in jets into the air, so as to be mixed and perfectly burned. The direction of the jets may be such as to draw air into the furnace, as in D. K. Clark's method. But for this present plan I propose to pump in the air under a pressure of about 130 lbs. per inch, and to make the air enter in directions corresponding to the petroleum vapor jets in order to cause perfect mixture and combustion. Now I expect there will be no solid matter resulting from the combustion —no soot or ashes—nothing but gas and water. If this perfection of combustion is attained, it will probably be by an excess of air, but that is a part of my plan, which is to make an engine in which hot air is one of the agents, as in Bennett's, Roper's, and others. The other agent is steam. The products of combustion are to go from the furnace, through proper valves, into the water; and to pass through proper screens of wire gauze, or other devices to cause the heat to be given to the water—such, perhaps, as spraying the water. The condition I desire is, that there shall be a mixture of hot gases and super-heated steam, of about 130 lbs. pressure, and of a temperature not over 500°, or not too hot for the working parts.

"This idea of forcing air through the fire into the boiler, through the water, and through the engine, was carried out by Capt. Bennett in the old steamboat Novelty, in 1835 or 1836; but he was troubled by ashes and unburnt fuel. The improvement now seemingly attainable will consist in perfect gasification, and avoidance of all that can grind the cylinders and valves, and foul the water in the boiler.

"It is doubtful whether we can retain the condenser. But perhaps we may send the products of combustion in the usual way through a boiler, and make pure steam, and temper the gases with a little steam on Mr. Wethered's plan, and use the pure steam in a condensing engine, and the mixed air and steam in a non-condensing engine. This practice may be well for a long-voyage vessel, in which the freight-room occupied by fuel is of such value as to warrant the expense and complication of a condenser.

"The uses to which this method is most likely to be applied are, for small engines in buildings, and for steam rail-cars and carriages. The boilers will be without tubes, and very small, and safer than common boilers; and insurance premiums will not be much increased by them; and the consumption of fuel can be economized, or stopped at any instant. When the jets of petroleum vapor are shut off, the generation of steam instantly ceases; and when the jets are throttled it is instantly diminished; and an automatic safeguard may be made to operate on the throttled, so as to lessen the heat as the steam pressure increases.

"As the advantages of this fuel, and this method of utilizing all the heat, so as to use as little fuel as possible, and especially as little water as possible, are not all apparent, it may be well to indicate one of them. There is now a new demand: underground railways are on the increase: Mr. Bazalgette, chief engineer of the English Board of Trade, reports that 258 new lines are already projected, their aggregate length to be 417¼ miles, and their estimated cost £70,000,000. These railways require engines that use the best fuel and water, and make the least dust and sulphurous gas. Now an ordinary locomotive wastes from 33 to 43 per cent. of its fuel through its chimney; that is, it pollutes the air with a hundred measures of gas instead of 57 or 67 measures. And as to water, by superheating the steam, and substituting air for it as far as may be without injuriously heating the apparatus, it is probable that we may work with a third of the water now used in locomotives. We can save a third of the gases, and two-thirds of the vapor, that pollute the air in tunnels. To meet this new demand we have this new fuel—this essence of coal—which, I hope, is to become cheap. But on this point Dr. Stevens can speak more prophetically than I can."

A GREAT OIL ENTERPRISE.

The Erie Despatch says:—A gigantic enterprise is now on foot at Titusville, Pa., and one which will settle many questions now in dispute in regard to the oil

theory. A company of reliable capitalist, with H. W. Potter, Esq., as president, has been organized for the sinking of a shaft at some point not yet determined upon, for the full and complete development of the geological peculiarities and facts of the oil stratification. The capacity of the preposed shaft is to be 7 by 15 feet, and it is supposed that the drippings of the rock, as the shaft progresses will nearly if not quite fully compensate for the labor and expense of the undertaking. This undertaking will involve a still greater degree of mining skill than any now practiced, as appliances will have to be made use of to keep the work free of the petroleum gas, which do not come within range of the ordinary class of ventilators; and these appliances alone will have to be so complete and effectual in their operation, that no ordinary skill can invent them. Of course, after the shaft has reached a proper depth to fully carry out the plan, it will be necessary to run leads and drifts at angles from the main stem, which will eventually create courses or successions of caverns, which become receptacles for oil, to be raised to the surface either by means of pumps or hydraulic pressure. The well known persistance of Mr. Potter argues for the success of his plan, and if it is among the possibilities to accomplish the work sought for, he will accomplish it.

A TANK CAR.

Mr. J. F. Keeler, of this city, has just received letters patent for a tank bottom railway car, intended for transportation of liquids. This car is made of sheet or boiler iron, of the same proportions as the ordinary house or box car. The tank is divided by longitudinal and lateral bulkheads into compartments of from five to ten barrels capacity, provided with suitable holes, pipes and stop-cocks for filling and emptying. It is calculated that by means of one of these tank cars one hundred barrels of oil may be safely carried. Above the tank, in the same car, solid freight can be carried, there being left above the top of the tank almost as much room for freight as there is in an ordinary box car.—*Pittsburg Even. Chron. Feb.* 9.

ALLEGED OIL DISCOVERY IN SOMERSET COUNTY.

We are assured, on very good authority, that petroleum has been discovered in some quantity in an abandoned well on the furnace property at Wellersburg, in this county. It has been the opinion for some time past, of those conversant with the geological formation of this county, that petroleum existed here, and a comparison with the oil-bearing region of Venango has so fully satisfied some of our wide awake citizens of the fact that leases, for boring purposes, have been secured of a large number of acres. As soon as the spring opens the matter will be thoroughly tested by companies now forming for that purpose.—*Somerset (Pa) Herald.*

OIL IN SOMERSET COUNTY.

In our last issue, we mentioned that we had reliable information that oil had been discovered in a well at Wellersburg, in this county, and we now have the gratification of announcing that a thorough investigation has demonstrated the fact beyond all cavil. The circumstances leading to the discovery, and the facts of the investigation, are as follows: The pump stock was being removed from an abandoned well on the premises of the Union Coal and Iron Company—abandoned some years ago because, as the former occupant expressed it, "the water was so stinking and greasy,"—when it parted, the lower joint falling back into the well, which stirred the water up from the bottom, and with it came up large bubbles, of what, on investigation, proved to be oil, in quantities sufficient to cover the top of the water. Of course the news spread and created some excitement, the unbelieving, among the which we were, alleging that it was a "plant," got up to hoax the community. John D. Roddy, Esq., of this borough, who owns lands in the neighborhood, determined to thoroughly investigate the matter. He had the water pumped from the well, and two or three feet of stones and rubbish removed, under his own personal superintendence. The water, as it came up, presented a greasy appearance, the loose stones in the bottom of the well, and the lower end of the pump stock were coated with undoubted petroleum, and an old pair of shoes, found beneath all the rubbish, were thoroughly saturated with oil.

Not yet satisfied, Mr. Roddy had the well pumped dry, and made perfectly clean. He than posted a guard over it during the night. In the morning about five feet of water had accumulated, the top of which was covered with oil. This was secured and bottled, and as we saw it, smelled it, examined and tested it, we are thoroughly satisfied of its being crude petroleum.

It is totally unlike the Venango oil, being a dark, heavy, consistent, tarry looking substance, corresponding with the Kentucky petroleum as described to us. The fact that it has forced its way up so near the surface—the well being only twenty feet deep—and its thick consistent character, is held by geologist to be evidence that it exists in large quantities. As an oil region, this basin presents one very great advantage over any territory yet developed, from the fact that it is in direct railroad connection with Baltimore and the West. The Union Coal and Iron Company's Railroad commences within a few rods of this well, follows the Valley to Barrellville where it intersects the Mount Savage road, which in turn connects with the Baltimore and Ohio road at Cumberland.

We congratulate the fortunate owners of real estate in the Wellersburg basin, for they unquestionable possess a mine of wealth beneath them.—*Somerset Herald and Whig, Feb.* 8.

MINING.

THE EXTRACTION OF GOLD AND SILVER FROM THEIR ORES.

A few days since we published an article on this subject, in which we stated that at least twenty-five per cent. of the gold and silver contained in their ores was lost in operating on them. Some of our cotemporaries took exception to this statement, which we made on facts gathered and experiments made during the past ten years. As an illustration of the truth of our statement, we refer to the last report of the Superintendent of the famous Gould & Curry mine; one on which the best machinery and most skillful amalgamators and chemists are employed. By that report we learn that the yield of the mine for the year ending on the first instant, was $4,808,000—in round numbers $5,000,000; which sum was obtained from 66,000 tons of ore, averaging about $75 per ton, the yield of which was only 70 per cent. of the assay value; so the tailings of the Gould & Curry of last year contain $2,000,000! To prove that this tremendous waste is not unavoidable, we cite the fact of a company giving the Gould & Curry $30,000 for 1,000 tons of these tailings and reworking them to a profit! There are probably scores of persons in this county who remember Capt. Kidd's old mill on Big Deer Creek, which did not save ten per cent. of the gold in the rock. There are many such mills now in operation in this State, the tailings of which would pay well to re-work by a proper process. It is our belief that nearly all of this waste might be avoided by the use of the proper machinery and skill. The question may be asked, if this were so, why the Gould & Curry company, with all their improved machinery and skilled labor, lose so large a per centage of their bullion. Were we a shareholder in that company, we should certainly ask such a question. There is not the least doubt that nearly the whole of this loss arises from the improper use of mercury in amalgamating. As we stated in the previous article on the subject, to grind mercury with the ores is certain to entail loss.

But most of the professional amalgamators are so wedded to old notions that they will not even listen to reasons for their abandonment. Few of them being men of science themselves, they look with disdain on those who are. When mercury is minutely subdivided the almost invisible globules become so coated with impurities that they lose the power of adhesion and will never re unite, unless force is used, and that force very different from grinding. This principle is beginning to be understood among the inventors of amalgating pans, and the grinding of the mercury is avoided as much as possible—those saving the most metal that grind it the least. The best machine for this purpose, that has come under our notice, is the pan invented by Baux & Guiod, which obtained the first premium at the last Mechanics' Fair at San Francisco. This pan differs from all the others in not mixing the mercury with the ores at all, but having a quantity of it on the outer edge, the particles of gold and silver in the ores, owing to the peculiar structure of the mullers, are injected into it by the centrifugal motion imparted to them and are forced to combine with, without dividing the mercury. The most improved Varney pans have slips of wood set into their bottoms to save the grinding of the mercury. The Wheeler's Tratory pan, a very scientifically arranged contrivance, confines the mercury to the center to avoid its being ground. The Gould & Curry use both the Varney and Wheeler's pans, with the result above stated. The fact that the loss of the mercury in the mills in the State of Nevada exceeds one hundred tons per annum, and in this State probably much more, is a proof of our statement that the loss of the precious metals, amounting to upwards of twenty millions of dollars per annum on this coast, arises from its improper use, for mercury never escapes without taking the other metals with it. As we have stated above, amalgamators are so wedded to their old notions that they will not listen to new ones, or the practice of agitating tailings, as they flow off, to cause the fine particles of mercury, gold and silver to settle, so contrary to every scientific principle, would have been abandoned long since. * * * In those remote ages, before the existence of this great continent was ever conjectured, though the discovery resulted from Columbus' search for Cathay, where gold was said to be had in abundance, the greater portion of the silver used was obtained from the mountains in certain portions of what is now known as Spain, where extensive smelting works existed before and after the days of the Roman Empire, and this fact furnishes a proof to support the argument to prove which these articles are written. The debris of these ancient silver mines, now yield a large income to a company which has been engaged for years in re-working them, as will the tailings from our present processes to some future metalurgists. Nearly all the silver of the ancients was obtained from the ores of lead, with which metal it almost invariably exists in combination in nature.

Within the past ten years, such improvements have been made in separating these metals, that by a process invented by a Mr. Pattinson, of Cumberland, England, it is profitable to extract the silver from the lead where it exists in the proportion of only two ounces to the ton.

In Reichenstein, Silesia, where there were gold mines worked nearly six hundred years ago, but abandoned through want of a proper process to save the precious metal, within the last, say fifteen years, Professor Plattner, of Freiberg, has perfected a process by which it is profitable to work ores that contain only 200 grains of gold to the ton; and these ores are arsinical pyrites, abounding in almost inexhaustable profusion in many parts of this State. This process is the foundation of all the new systems for working sulphurets by chlorine gas. Until the discovery of the immense gold deposits in this State, nearly all the gold in Europe came from "Afric's golden sands," on the Guinea coast; the silver from England and Spain. Up to that discovery, according to the calculations of men conversant with the subject the total quantity of gold in the whole world was valued at $2,800,000,000. Previous to that discovery the whole gold product of the world did not exceed $30,000,000 per annum, but little, if any more, than six month's yield of the mines of California.—Since 1849 California has produced upwards of $800,000,000, in gold, and lost nearly half as much more through want of proper means for saving it.—*Grass Valley Union.*

THE GRASS VALLEY MINES.

[Extract from a private letter addressed to a gentleman in San Francisco.]

* * * * This is an exceedingly interesting mining district, both for the number of extensive profitable mines, and for the promise of many more in consequence of the renewed interest in the region, and a better appreciation of its many advantages.

Numbers of the enterprising miners, who left here a few years ago for other fields of supposed greater promise, are now returning to their old claims, and are surprised at the richness and value of the ground they abandoned. Many of the veins which were prospected only to the depth attainable by the windlass rope, are now being opened and prepared for further development.

I am very much pleased with the veins. They are numerous and well defined, with all geological evidences of permanency, while they are generally well charged with free gold, giving from $20 to $160 per ton in the mills. There is scarcely a dump-pile of quartz in that region that does not show masses rich in free gold. The quartz, instead of growing poorer in gold as you descend, has in most cases been found richer than near the surface. The "Eureka," or Fricot's vein, is a notable example. The vein recently cut in the second level, 200 feet from the surface, is three feet in thickness, and is liberally spangled with gold — There is a fine new mill upon this property and others are erecting upon the continuation of the vein, which may be followed for a long distance, and is supposed to pass through the Burdett ground. A group of veins upon this claim has afforded considerable quantities of ore charged with coarse gold. In another part of the district, the Merrimac mill and mine is worthy of mention as a model of economical and effective working.

The Watt and the Rocky Bar mines upon Massachusetts Hill, the Allison Ranch mine, the "Lone Jack," the Luky Co., and others are doing well, fully sustaining their reputation. In addition to the favorable character of the veins and their richness, Grass Valley has the following advantages: It is accessible, and is in a pleasant, healthy region, where provisions and transportation are cheap. It has a large population of skilled underground miners, attracted there by the several old established and profitable mines. There is no place in the State where such a fine body of miners can be found permanently settled with their families. Lumber and timber for the mines, and fuel, are abundant and cheap. An extensive growth of young pines over the hills that were denuded of their trees in early days, will afford excellent mining timbers in a few years.

With all these advantages, and an extensive region in which new discoveries of veins are constantly made by dilligent prospectors, Grass Valley is destined to become the chief mining center of California, and may at no distant day merit the title of the Freyberg of America. Yours truly,

WM. P. BLAKE.

PRODUCT AND AREA OF THE MINERAL DOMAIN OF THE UNITED STATES.

The following is taken from the annual report of the Secretary of the Treasury. It is a most valuable and interesting paper written by Lorin Blodget, Esq.

MINERAL LANDS AND MINES OF THE UNITED STATES—DISTRIBUTION OF THE GOLD PRODUCT.

The tenure under which the mines and mineral lands of the United States have been held has been generally similar to that of European countries, the superior claim of the national sovereignty having been always maintained. There has been no royalty or tax of importance collected in any case, however, and with the exception of a small amount paid under leases of lead mines and salt springs, no revenues have been received from mineral reservations, nor from the mines when worked. The care and custody of the mineral lands of the United States was with the War Department, until by the act of March 3, 1847, they were transferred to the Secretary of the Treasury. Finally, on the organization of the Interior Department, by act of March 3, 1849, they were transferred from the Secretary of the Treasury to that Department.

Special acts of Congress at various times directed the sale, or gave the title to States in which they were located for sale, or reservations of salt springs and mineral lands. An act of March 3, 1829, directed the offer for sale of lead mineral lands in Missouri, after a descriptive advertisement should be issued, and six months' notice given. The act of March 3, 1847, by which the leases of lead mines were transferred from the War Department to the Treasury Department, established a general system of sale for the lead mineral lands, then the only important mineral lands worked on the public lands of the United States, at a minimum of five dollars per acre, subject to requirement of complete clearance under the lease, and to specific regulations as to the subdivisions, and proofs of mining title. The option of the mining occupant to continue under any existing lease was especially reserved.

This act was urgently called for by the people of Wisconsin and Iowa, in which States the lead mine reservations had become a serious obstacle to the general improvement of the country. The area covered by these reservations was all valuable for agricultural purposes as well as for mining, although not large in the aggregate.

The discovery of gold mines on the Pacific coast was not accompanied by any action of the general government directed toward the raising of revenue from them, nor by the establishment of any system of supervision or superintendence constituting a practical possession by the United States. On the discovery of gold some years later in the district of Frazer's river, in British Columbia, a system of taxation was attempted by the British authorities, but its injurious consequences caused the abandonment of its principal requirements after a very brief trial.

In California the authority of the United States has never been exercised over the mineral lands further than to reserve them from sale and to throw them open to the public for mining, without tax or charge of any kind. No system of mining superintendence has been established, as in Australia. The local law, originally established by the miners themselves, was for some years the only law known, the State laws ultimately recognizing and establishing the principal parts of this mining code. The State of California has also imposed a lease tax of four dollars per month on mining claims held by aliens, the act being especially directed against the Chinese.

The production of gold in California, Oregon, Nevada, Arizona, Washington Territory, and British Columbia, all enters into the trade of San Francisco, with the exception of some exports direct to England from British Columbia. The commercial statistics of that port, carefully and regularly compiled for some years past, show that the aggregates were, for—

1862,	$50,000,000
1863,	55,000,000

Of these sums the annual product of British Columbia was nearly $2,000,000, and the products of 1863, other than this were divided as follows:

California,	$34,500,000
Nevada,	12,500,000
Oregon, Idaho, and Arizona,	6,000,000
	$53,000,000

One-fourth of this sum is the estimate of gold brought to San Francisco by private hands, three-fourths only, or $39,700,000, being open to commercial examination and statement from the records of business houses and the mint.

The export statement at San Francisco, made up by commercial authorities, covers all sent to both the coastwise ports of the east and to foreign ports. The sums for several years are as follows:

For 1854,	$52,045,633
For 1855,	45,161,731
For 1856,	50,697,434
For 1857,	48,976,697
For 1858,	47,584,026
For 1859,	47,640,462
For 1860,	42,825,916
For 1861,	40,676,758
For 1862,	42,561,761
For 1862,	46,071,020
For six months to July 1, 1864,	28,993,711
For fiscal year 1863-'64,	51,264,023

This statement includes an average of $750,000 annually of foreign gold and silver coin, and recently from $1,500,000 to $2,000,000, the produce of British Columbia. The average of five years export, 1859 to 1863 inclusive, would thus give $41,000,000 only to which a duty or tax could be applied, as in Australia At 2 per cent. the Australian rate for 1863, nearly, the proceeds of such tax or duty would be $820,000 yearly

To this account of production there are now to be added the sums realized in Colorado and Montana, or such portions of Idaho and Montana as do not send to San Francisco. The amount produced in these Territories is not definitely stated by any authority, and it can only be estimated. For 1863 it was less than $5,000,000, the greater part, however, passing through no positive official or commercial record. In the last three fiscal years the coinage and assay of Colorado gold have been:

1861-'62	ending	June 30,	1862	$2,035,416
1862-'63	"	"	1863	2,598,337
1863-'64	"	"	1864	2,136,686

Gold of Idaho Territory was assayed and coined at New York and Philadelphia in the fiscal year 1863-'64 to the value of $1,049,070. The entire coinage and assay of gold produced east of the Rocky Mountains in 1863-'64 was about $3,000,000, which represents all the available product of mines not taken into account at San Francisco.

The sums of treasure within reach of taxation on assay, or as the product of mines within reach of a system of mining superintendence, would, at the highest, be for the year 1863-'64—

On the Pacific coast	$40,000,000
Colorado and the east	3,000,000
Total	$43,000,000

The highest estimate for the next fiscal year 1864-'65 would not reasonably exceed $45,000,000 in all. In both cases it is assumed that the entire product of the mines is reached, not alone the portion now coined and assayed in the mints.

The extent of the present reservation of gold and silver mineral lands in California is about 10,000,000 of acres, and when surveys are completed for the entire State, the quantity will be somewhat greater, most of these lands being capable of occupation. The whole area of State is 121,000,000 of acres, of which one-half at least, is wholly incapable of occupation, as mountains or deserts. Assuming 60,000,000 of acres as being in some way available for occupation, the mineral reserve becomes one sixth of the surface capable of use.

The proportion of reserved mineral lands in other States and territories cannot be stated, except by estimate. But for the purpose of examination, the following areas may be assumed:

	Whole area.	Mineral reserve.
California	121,000,000 acres	10,000,000 acres
Oregon	61,000,000 "	2,500,000 "
Washington	38,400,000 "	500,000 "
Dakota	62,500,000 "	1,500,000 "
Idaho	62,525,000 "	2,500,000 "
Montana	83,375,000 "	500,000 "
Colorado	67,725,000 "	5,000,000 "
Arizona	78,550,000 "	2,500,000 "

The entire probable reserve out of California thus becomes 15,000,000 of acres, and the whole 25,000,000 acres.

The extent of this reserve of lands, in many cases capable of cultivation as well as containing minerals, has created much discontent in California, since no title can maintain possession but one dependent on actual mining. When abandoned as mines they cannot be

occupied for cultivation, except at the risk of dispossession, at any moment by an actual miner.

There is, and will continue to be, undoubtedly, a strong pressure for a disposition of a portion, at least, of the mineral lands in California, on the same principle and for the same reasons as the sale of lead mine reservations in Wisconsin and Iowa in 1847. When mining becomes too expensive to remunerate the miner he must abandon the lands, and cannot remain as a cultivator. It is said that a considerable area, once profitable for surface mining, is now so unoccupied and that the interests of the people demand that it be put on sale for permanent title.

The bill (of Senator Conness) introduced into the Senate, June 29, 1864, (S. 340,) of the last session provides that on the memorial of the legislature of California, Oregon, or other State or Territory, the President may order survey and sale, under direction of the Secretary of the Interior, and according to the rules of the General Land Office. The minimum price is not named in this bill, but private memorialists urge that the minimum be thirty dollars per acre. The right of pre-emption and the security of mining titles are guaranteed in the bill.

THE GOLD AND SILVER CROP OF 1864 IN THE PACIFIC STATES.

"The total receipts of gold and silver in San Francisco during the past year, through public channels (including coin) amounted to $55,000,000, as against $52,000,000 the previous year.

"The product of the precious metals on the Pacific coast for the year 1864, (if an allowance of say 15 per cent. be made for receipts by private hands,) will reach an aggregate of some $56,000,000. This is nearly $4,000,000 in excess of the year 1863. The north coast has sent us $10,000,000, including $1,750,000 from British Columbia.

"Nevada produced within a fraction of $16,000,000 rom the following localities, as against $12,400,000 during 1863:

Virginia City,	$10,425,350
Gold Hill,	1,402,396
Aurora,	960,000
Humboldt,	90,000
Carson,	1,994,884
Silver City,	229,000
Dayton,	220,000
Reese River,	500,000

"The following figures may serve to show in some degree the currency movement of the past three years, and perhaps give some idea of the amount of coin in circulation in the hands of the people:

Coin remitted to interior,

1862.	1863.	1864.
$12,4498,548	$12,916,781	$10,800,920

Coin received from interior,

1862.	1863.	1864.
$5,593,421	$6,383,974	$5,743,399

Balance added to interior circ'n. $6,905,127 $6,532,807 $5,057,527

Total.....$18,495,461

"The total coinage of the Branch Mint in this city, for the year 1864, amounted to $16.323,000."—From the "Weekly Stock Circular" of the Associated Brokers, dated San Francisco, Saturday, January 14, 1865.

HOW A LAKE SUPERIOR COPPER MINE PAYS

THE QUINCY COPPER MINE, OF PORTAGE LAKE DISTRCT.

"Office of Quincy Mning Company, No. 51. Exchange Place, New York, February 9, 1865.

"Dividend.—The Board of Directors have this day declared a semi-annual dividend of eight dollars per share, from the earnings of the six months ending December 31, 1864, payable on and after Monday, the 27th instant. Massachusetts holders to be paid at the office of T. Henry Perkins, No. 19 State street, Boston, until April 1. The transfer books will be closed from February 18 to 27, inclusive.

W. Hart Smith, Treasurer."

Out of the profits of the previous six months ending June 30, 1864, a dividend of eight dollars per share was paid, so that for the year 1864 the holders of Quincy shares were paid sixteen dollars per share dividends.

The company is without debt, and its "capital stock paid up in full" is $200,000. Now, as its two semi-annual dividends paid out of the profits of 1864 amount to $16 per share on the 20,000 shares into which its capital is divided, its whole payments for dividend account for 1864 were $320,000, which is equal to one hundred and sixty (160) per cent on its $200,000, of capital stock

In 1863 the Quincy Mining Company paid dividends amounting to $12 per share, and to $240,000 on 20,000 shares, equal to 120 per cent on its capital of $200,000.

After paying $12 per share in 1863 there remained on hand a surplus in the treasury of $120,000, equal to $6 per share. And for 1864, after paying $16 per share, there remained an increased surplus over 1863.

The Quincy, Pewabic and Franklin mines, three mines in a row, are all dividend paying mines. A little farther east, crossing the same lodes, looms the Albany and Boston mine—destined to become a big and profitable mine. Between, also on the same lodes, is the Dorchester mine, and when, next summer, Lehigh parties visit the Dorchester location, they will pass over the Quincy, Pewabic and Franklin mines to reach it.—*U. S. R. M. Register.*

THE GENII OF THE MINES.

We often wonder if the author of the Arabian Nights ever wandered through a land so prolific of strange events and wierdly wild scenery as this our new State. What food for thought, what material for the writer of legends is here furnished. What was the wealth of Aladdin's or Cassim Baba's caves to the treasures which lie buried in every hill that stands sentinel upon our city; and what the sudden transition from poverty to riches enjoyed by the poor wood-cutter of Bagdad to that experienced by some of our miners in a single day? These stories of Eastern romance, with all their improbabilities, are rendered commonplace when contrasted with events of everyday life in this strange land. Sometimes, while looking down into the yawning shafts, where the swarthy miner delves by the light of his flickering lamp, we have recalled the marvellous stories that charmed our childhood, and could almost imagine we inhabited the land of ghouls and affrites; and when the earth trembled above the mighty blast, as though some angry spirit was confined in its bosom, we have almost expected to see a colossal figure emerging from the smoke and flame, to bear us off to one of those enchanted palaces or fairy islands, where less favored mortals are never allowed to enter. But the mighty genii of our mines have more profitable work on hand than kidnapping knights of the quill. They dig far into the bosom of the earth, they wield the pick and the drill, they ignite the mine, and they bear to the light of day huge masses of dark ore. They build the mighty engines, where the red eyes of furnaces are never closed, they hurl the ponderous stamps which crush the rock, and they transmute the dark pulp into shining gold and silver, which flows forth to enrich and gladden the heart of mankind. Their labors are unceasing, and the blessings they confer are manifold. The genii of our mines are Enterprise and Industry.—*Reese River Reveille.*

LA FAVORITA MINING COMPANY.

We make the following extracts from the report of the Trustees, at their second annual meeting, January 3d, 1865:

This Company was organized June 25th, 1863, to develop "La Favorita" mine in Sonora, Mexico, some 200 miles east of Guaymas. The capital stock is divided into 2,400 shares, of $100 each, of which 1,400 are assessable and 1,000 unassessable. Of the latter, 800 are owned by the discoverers and 200 by the Company, who have lately offered these 200 unassessable shares to parties in New York at $100 currency, and in London at £8 sterling, per share, and as soon as their negotiation shall have been effected, no more assessments will be required.

Work was begun in December, 1863. The first product was 38 bars (1¼ tons) of pure copper, reduced by Superintendent Thielebien, at the Company's works. Three and a-half tons concentrated ore, and 1,500 pounds crude ores (gold, silver and copper), were shipped to England in July last. A small lot of crude ores arrived here in August, and work was resumed on the 12th of October, with 20 men, in three shafts and two drifts. Of the ores taken out since then, 8½ tons reached us last month. The two latter shipments have been sent to Swansea, and the following advances were obtained thereon: first shipment, $1,500; 2d do., $300; 3d do., $800; total, $2,600. The difference between the sums advanced and the proceeds realized from their sale will be paid as soon as such sale shall have been ascertained. The complement of men at the mine has been increased last month to 40, and double their number can and will be profitable employed this or next month, if our finances will permit such increase.

Supt. Thielebien died suddenly on the 16th of June, Carlos E. Seele was appointed his successor.

The shipment of crude ores having now convinced all the stockholders of the value of the mine, and freight being to high to continue them, the Superintendent has been instructed to concentrate ores by smelting, which will materially augment our profits by decreasing the cost of transportation.

The mine yields now, monthly over 25 tons of first-class ore (valued at about $225 per ton), which quantity is constantly increasing, and nothing is required to insure a speedy beginning to an uninterrupted series of dividends save the means of earning our own transportation, which end to accomplish we deem it our duty to endorse the recommendation of the Superintendent in regard to the purchase, at the earliest convenience, of about fifty mules, with pack-saddles. They would pay their own cost in less than eight trips, besides the immense saving of freight. The cost of their sustenance would be amply covered by return freights.

Signed by the Trustees: E. T. Anthony, A. Hildebrand, E. J. Pfeiffer, M. Fenstermacher.

MINING REVIEW (PACIFIC COAST) FOR 1864.

The past year has not been all light and prosperity to the dwellers in California. A long drouth of a severity unprecedented since the commencement of the mining era on this coast, and unexpected reverses in stock operations, have more or less affected all, and have brought sore trouble upon not a few. The terrible conflict of gigantic war, which is desolating a large portion of our Atlantic territory, has also aggravated, to a considerable extent, the failure of our crops and and other calamities in our midst. Prosperity had made us prodigal of the gifts with which the Almighty had blessed us, and were quite unprepared for the heavy hand of chastening which has been laid upon us. The dark cloud of war, however, is now growing brighter in our Eastern horison; and copious rains have been poured out upon thirsty mountain slopes and parched fields gladdening alike the miner and the husbandman, and giving token of "an early harvest and plenteous year" for both corn and gold.

A careful examination of the mining interest, at this time, can scarcely fail to fill the observer with most sanguine hopes for the immediate future of that great and leading industry. It is quite apparent that we have now passed through the almost fatal epoch of general demoralization, brought upon us by unprincipled speculators, by an unwise impoverishment of our principal mines, and by the inexperience ever attendant upon all new enterprises. Capitalists, who but a short time since had lost all faith in Silverland, and hated the very name of Washoe, are now beginning to express renewed confidence in their value and the exhaustless wealth of our mines.

What though Ophir has ceased for a while to yield its monthly dividends, and Gould & Curry has failed to pay the enormous returns that were forced from it a

year ago by an unwise system of working? The history of mines, the world over, tells us that we must look for alternatives of wealth and barrenness; and mining in Washoe is governed by the same rules as elsewhere prevail. Days of darkness and distrust are followed by the brightness of sunshine. The hill sides and mountain tops of our extended and increasing mineral territory will continue to resound with the pick, shovel and stamps for ages yet to come. It is not in the power of this generation, however freely it may expend its energies and means, to fully develop, much less exhaust the mines already brought to light.

Mining Not Necessarily Speculative.—Mining is not all adventure, nor is adventure, judiciously planned, an altogether forbidden thing in the counting house or even in the banker's closets. Very close calculations can be made in mining enterprises on quite slight and inexpensive trials, where experience and calm judgment are allowed the control. The miners of California and Nevada are now acquiring—nay, have already acquired a degree of experience, which if rightly applied may enable them to carry on their work intelligently, and where integrity prevails, there is little risk of loss. Capital, especially from the East, can now be secured to an almost unlimited extent, where good evidence can be given that it will be judiciously expended and honestly guarded.

Now that the excitement of the past two years has fairly subsided, and we are able to calmly observe its unhappy and injurious effects upon individuals and the community, leading people into all manner of extravagant speculations and criminal practices, it is to be hoped that, in the future, we shall be less fickle, less excitable, and more earnest and more cautions in our operations than heretofore. Let honesty, perseverance and patience be directed by indomitable Anglo-Saxon will, and we may remove mountains and uncover wealth, which will ere long render California the monetary and commercial, as she already is the geographical, center of the earth.

The Prospecting Mania.—The prospecting mania, which has been so rife for the past two or three years, appears to be fast dying out. Notwithstanding vast sums have been expended in this wild spirit of adventure, almost universally to the loss and often to the utter ruin of the adventurers, still a large amount of good is beginning to accrue to the community at large. By it, vast regions of country, which would never have been visited by the plodding and cautious calculator of dollars and cents, have been opened up to the reach of industry and made useful to men. From the first discovery of silver on the eastern slope, we, as a people, have made great strides in the development of new mineral territory. Our hardy pioneers have forced their way out into forbidden fields, with an energy and enterprise, without parallel in history. Pushing out to the north, south, and east, the Californian's pick and shovel now resound in almost every part of the vast region between the Rocky Mountains and Sierra Nevadas, from the Mexican line on the south, to the British border, and beyond, on the north.—*California Paper.*

COPPER MINING ON LAKE SUPERIOR.

The *U. S. R. R. Mining Register*, says:—The progress of every material interest on the earth is corrugated with valleys in shadow and hill tops in sunshine, is varied with periods of depression and prosperity. This is especially noticeable in the history of the coal trade of Pennsylvania and the copper trade of Michigan. Even the oil trade of Pennsylvania, now in its sixth year, not half way to the teens of youth, contains record of good and bad times in its annals, 1861 being as remarkable for the unremunerative as 1864 was for the most remunerative condition of the oil trade.

But these changes, which occur as well in commerce and in manufactures as in mining, do not estrange investers where an interest can command for its product a place in a market from which it cannot be driven by competition, for it is by averages of years, by short cycles of time, that the success of an important interest in a new country is judged.

A metalliferous mine, judiciously located and properly opened, after it begins to pay, continues to pay. The oldest mine on Lake Superior, the Cliff, has earned and paid a big dividend every year since it was opened, and is vastly more valuable to-day than ever before.

In the copper region of Michigan there are twenty thousand indwellers, whose labor and fortunes are identified with copper, for copper is their sole export staple, and the copper mines are their exclusive reliance And this population, which is isolated by water and by wilderness from all other communities, exhibits rapid increase from year to year, simply because the expansion of the mining interest enlarges the market for mining labor, and realized profit entices new investment.

The high rank of copper among the metals, the vastness of the markets open to it around the world, lend to the business a fascination, and make it, turn and turn again, a favorite in the stock market, where the rule is, constancy to one love at a time, but not to any one love long!

The subjoined communication, furnished to us from a competent source, contains data which will convey solid information to all persons interested in the yield of mines, whether mineral or metal.

But two short links of rail—one to close a gap at Green Bay, the other an extension, both included in existing plans—are needed to fill out unbroken rail communication (via Chicago) with the Lake Superior copper region. Then it will be as easy and convenient, and as cheap in time and money, to ride in cars from Philadelphia to the Lake Superior copper mines, as it now is to ride in cars from Boston to St. Louis! This is the whole story. The lakes afford cheap transportation, and the rail will supply swift conveyance.

"Average cost of working 34,500 fathoms of ground in the copper mines of Lake Superior, on a scale of 115 fathoms ground per day, or 2,875 fathoms per month, or 34,500 fathoms per annum, at an average cost of $90 per fathom, or $10,350 per day, or $258,740 per month, or $3,105,000 per annum.

"In tons, the average is 2,070 tons per day, 51,750 tons per month, or 621,000 tons per annum, at an average cost of $5 per ton, or $10,350 per day, or $258,750 per month, or $3,105,000 per annum.

"The product in mineral as shipped was 27 8-10 per ton, or 500 lbs. per fathom of 216 cubic feet, for the whole amount of ground wrought, 34,500 fathoms that have produced 8,625 tons of mineral; value of the mineral as shipped at 36 cents per pound, (present market price of ingot 47 cents per pound), or $720 per ton, gives $10 per ton, or $180 per fathom for the whole amount of ground wrought, or an average product of $20,700 per day, or $517,500 per month, or $6,210,000 per annum, and a net profit of $5 per ton, or $90 per fathom, or $10,350 per day, or $258,750 per month, or $3,105,000 per annum.

"This estimate is intended to cover all regular mining costs; stamping and drifting, transportation, smelting, commissions and sales, when a mine is in full operation and well opened, which will cost at present rates of expenses about $200,000 to open a first class mine.

A Miner, of Lake Superior."

THE AMERICAN EXPLORING COMPANY.

The stockholders of the American Exploring Company, which was organized in April, 1864, in this city, to prosecute explorations in the Territories, with a view to the discovery of the precious metals and the purchase of mining sites in the auriferous and argentiferous districts which jewel the Government domain, assembled at their Rooms, No. 324 Walnut street, on Tuesday evening, Feb. 14, to hear the report of their agent, Professor Alfred Du Bois, Geologist and Chemist, on his explorations and purchases made in the South Park of Colorado, the scene of his scientific researches and labors and of the company's investments and operations.

Every stockholder, we believe, but one or two, were present; certainly more than nineteen-twentieths of the shares were represented at the meeting—a most unusual occurrence—and the proceedings throughout were marked by earnestness, concord and importance.

The best index to the character of a meeting is to be found in the names of the participants, whilst for its object we must search the result of its deliberations. *U. S. R. R. Mining Register.*

GOOD HOPE GOLD & SILVER MINING CO.

The Trustees of this company, which is located in the Alpine mining district, Alpine County, have submitted the following as their report for 1864:

Work on the mine was commenced in March last, since which time a shaft has been sunk thirty-two feet deep, and a tunnel run two hundred and twenty six feet long, and 4 1-2 by 6 1-2 feet in the clear. A shed has been built over the shaft, and a blacksmith shop at the mouth of the tunnel. We have labored under great inconvenience from want of funds, but have persevered through the severest times the country has ever seen, and have finally reached a promising ledge about four feet wide.

STATEMENT.

The Co. has bought at sundry sales,	1,389½	shares.
The Co. has sold to sundries, . .	1,179	"
Leaving a balance to the credit of Co. of	210½	"
Am't cash received from Assessments,	$2,203 69	
Am't cash received from sales of Stock,	1,371 75	
Total cash receipts, ...	$3,575 44	
Am't of cash paid on Contracts, . . .	$1,160 50	
" " for day labor, ...	978 25	
" " Advertising and Printing, .	273 09	
" " Superintending Works, . .	514 00	
" " Salary of Secretary, . . .	260 00	
" " Blacksmith and Mining tools,	81 75	
" " Powder, Fuse and Candles, .	65 37	
" " Working rock and expenses,	51 00	
" " Selling delinquent stock, . .	35 50	
" " Timber land—80 acres, . .	32 50	
" " Sundry fire assays	28 50	
" " Lumber for the Mine . . .	13 00	
" " Supplies Sec'y. Supt. & Treas.	24 16	
" " Repairs on Mining tools . .	13 00	
" " Telegraphing and Expressing	13 35	
" " Sundries, Supplies for Mine . .	31 59	
Total Disbursements	$3,575,34	
The present indebtedness of the Co. is	$ 141,75	

Preston Morris,
Secretary.

The Redan Gold Mining Co., is the name of a new mining company, which filed its certificate of incorporation in the office of the County Court of San Francisco. This company has been organized with a capital of $150,000, divided into 3000 shares of $50 each, and is composed of some of our solid men, says the San Francisco Mining Press. This company has been organized to work what is known as the Redan Mine, of Grass Valley, Nevada County, a well known extension of the Heuston Hill mine. The company will proceed immediately to the erection of suitable machinery for working the mine. It is located in a most promising neighborhood, and one in which heavy operations have been conducted for many years.

Very Rich.—Ten tons of rock from the Morning Star claim, Idaho, was crushed recently and yielded 1,000 pounds; 12,000 ounces of bullion. The Oriental had fifty tons crushed, which paid $560 per ton; the Gambrenius mill after a run of sixteen days crushing; 252 tons of rock; cleaned up over sixty-four thousand dollars, or over two hundred and fifty dollars per ton.

The Victoria Colonist mentions that a miner has struck a quartz lead on Wolf Creek, Leech River, for which he has refused ten thousand dollars.

GAS.

J RIFYING GAS BY OXIDE OF IRON.

When bituminous coal is placed in a close retort so as to be shielded from contact with the air, and its temperature is raised to a bright cherry red, it is decomposed, and its elements re-combine to form a great number of new substances. Among these are light and heavy carburetted hydrogen, and a number of volatile hydro-carbons, which mingled mechanically together constitute illuminating gas. There are also a number of hydro-carbons which by being cooled are condensed in the form of tar. Besides these, three gases are formed which will not condense in cooling, and which are so offensive and deleterious that if they could not be removed they would render coal gas unfit for use in our dwellings; these are ammonia, carbonic acid, and sulphuretted hydrogen. Fortunately ammonia has so strong affinity for water that it is only necessary to expose the gas to a large surface of water to have all of the ammonia absorbed. Both of the other two impurities are eliminated by passing the gas through several thin beds of lime.

This is the plan in general use in this country, but in England a different method of extracting the sulphuretted hydrogen has been invented, and is rapidly extending. This consists in substituting for lime the hydrated oxide of iron.

Le Gaz says when sulphurreted hydrogen is brought in contact with hydrated oxide of iron both compounds are decomposed. The oxygen leaves the iron to combine with the hydrogen, and the sulphur combines with the iron, forming sulphide of iron. Consequently oxide of iron is an effecient medium for purifying illuminating of sulphuretted hydrogen. But the cost of oxide of iron would have precluded its use for this purpose were it not for the fact that by exposure of the sulphide of iron to the action of the atmosphere it is again converted into oxide of iron—the oxygen of the atmosphere displacing the sulphur. This action is sometimes so rapid as to heat the iron red hot.

It is only necessary, therefore, to expose the iron to the action of the atmosphere for it to become ready for use a second time; and thus it may be employed 30 or 40 times. The sulphur displaced remains mechanically mingled with the mass, increasing its weight by repeated use finally to the extent of 30 or 40 per cent.

The oxide of iron is employed in the form of course powder mingled with saw-dust, and is spread in beds 12 to 18 inches in thickness, in purifiers similar to those in which dry lime is employed. The gas must finally be passed through one thin layer of lime to take out the carbonic acid.—*Sc. American.*

GAS BURNERS.

ERNEST JOURDAN, Paris—Patent dated May 7, 1864.

This invention relates to an apparatus to be applied to any ordinary gas burner, but more particularly to that description known as a "bat wing," whereby a more intimate admixture of air with the gas at its exit is accomplished, thereby effecting a considerable economy of gas and producing a better light from a given quantity consumed. According to this invention it is proposed to adjust accurately over the aperture or apertures of the burner a piece of metallic or other wire gauze capable of withstanding heat, the gauze being so applied as to leave a free space or chamber intervening between the burner and the gauze itself. The gauze may be fitted inside a metal or other cap provided with a slit or other suitable opening at the top, to allow the gas to pass through after passing through the gauze, such cap being placed over and fitting accurately around the burner, and provided with one or more projections or catches for the purpose of holding the same securely in its place.

Upon the burner is adjusted a close fitting cap, which serves to support or hold in its proper place over the burner, the fine wire gauze, which is placed inside the cap. This gauze, when adjusted in its proper place, fits closely over the orifice of the burner. A slit or other opening, according to the kind of burner employed, is formed in the cap to allow the gas to pass through after permeating the wire gauze. The cap may either be pushed into the burner, or it may be screwed thereon, or fitted thereto in any other convenient manner.

PURIFICATION OF GAS FROM BISULPHURET OF CARBON.

Mr. Lewis Thompson, M.R.C.S., etc., writes to Newton's London Journal of Arts that, having discovered that steam and bisulphuret of carbon cannot exist together at a red heat, he thought the fact might be applied to purify gas; and tried it on 15,000 cubic feet of coal gas, the whole of which was found, by careful experiments, to be altogether free from the slightest taint of bisulphuret of carbon. His process was this: before the gas entered the condenser, it was forced through a cast iron tube five inches diameter and twelve feet long, kept at a cherry-red heat, at he rate of 1,500 cubic feet per hour. The quantity of steam required was 60 to 80 cubic feet, or 3 to 4 lbs. per ton of Newcastle coal. An excess of steam is not very objectionable, as it is useful during condensation. The gas purified in this way, burnt in an argand burner at the rate of five cubic feet per hour, gave a light equal to 13¼ standard sperm candles.

GAS LIGHTING IN AUSTRIA.

The town of Kronstadt, in Transylvania was first lighted with gas on the 26th of september last, the entire works, mains, &c., being furnished and erected by Messrs. J. T. B. Porter & Co., of Johns street, Adelphi, and Lincoln. The gas is made from wood, which is furnished by the municipality under the concession at a minimum fixed price. The gas is of a first-rate quality, and the consumption is in excess of what was anticipated. Messrs. Porter & Co., are the proprietors of concessions for lighting by gas twelve other towns in the Austrian empire—viz: Baden, Raab, Fimfkirchen, Ischl, Karlsbad, St. Patten, Krems, Wells, Znaym, Komotan, Gorz, and Zara, which will be completed during the present year. The whole of these enterprises are included in the operations of the "Imperial Austrian Gas Company." With the exception of Kronstadt, coal will be used for the manufacture of the gas. Many of the coal-fields in Austria are equal to the English in the production of material for gas purposes.—*London Journal of Gas Lighting, Jan.* 10.

GAS REGULATORS.

These regulators, patented as a communication from Mons. Girond, of Paris, by Mr. Henry, patent agent, Fleet-street, consist of moveable valves or hollow plungers, worked by what is called the regulating gas—that is, the gas on its way to the burners from the regulating apparatus, the plunger being suspended from a weighted crank or beam, and being only worked when the supply is in excess of the combustion. There are also concentric chambers, in which the valves work, such chambers acting as water spaces and gas passages. The under part of the float or plunger is conical. The system may be adapted to pressure indicators, and to working clocks or time-keepers.

FEARFUL GAS EXPLOSION.—An explosion of gas occurred in Greyfriars Church, Reading, (England,) recently. The Rev. Mr. Barkworth was blown up from his seat and fell on the floor, injuring his face, but not severely. A careful exrmination of the floor was made, and it was discovered that the gas was rapidly escaping from a joint in the pipe immediately below the standard, in consequence of its having been improperly fitted.

Animalculæ have been discovered so small that one million of them would not exceed the size of a grain of sand, and five hundred millions would sport in a drop of water. Yet each of these little beings must have blood-vessels, nerves, muscles. circulating fluids, &c., like lhrger animals.

RICH SILVER ORE.—We were shown a very rich specimen of silver ore, says the San Francisco Mining Press, from the La Libertad silver mine, located in the Cacachillas District, Lower California and distant some six miles from Ventana Bay and sixteen miles from La Paz. This mine was purchased about two years ago by Col. Leese, from a Mexican who had taken from the croppings upwards of $90,000. A company was formed in this city about eighteen months ago, to work the claim which consists of 2622 feet. A tunnel has been cut at right angles to the main lode, on the water level, 200 feet in length, with a good air shaft. A spur of excellent ore has been struck in the tunnel about twenty feet from the main lead, from which the specimen above alluded to was taken as a sample, and which, assayed by Messrs. Riehn & Hemme, was found to contain at the rate of $3,961,77 in silver, and $43,32 in gold, or $4,005,54 to the ton of 2,000 pounds. The specimen, until after the assay, was not considered of extraordinary richness, being taken as a mere average specimen of the vein. As the Mexican law allows rough metal to be exported from Lower California, the product of this mine can all be forwarded to Swansea at a small expense, and if the main lead is of the same character as the spur in the tunnel, the La Libertad will be one of the richest mines in the world.

GEOLOGICAL AND PHYSICAL FEATURES OF THE ESTATE of the Pacific Coal Petroleum Company's oil property, taken from Professor B. Silliman's report. —The important physical feature of this estate is the existence of a line of fault marked by the Arroyo Grande or great ravine which runs up from the sea coast to the rancho of that name on its eastern boundary, forming at the same time the property line which separates the Pismo and Corral ranchos at the north, from the Manuela and Bolsa de Chemisal on the south. This Arroyo appears to have had its origin in the upheaval of the high broken Chemisal ridge which surrounds the Manuela Rancho, giving to it the character of an interior valley.

OF THE OIL OUTCROP ON THE BRANCH ESTATE.—Both oil and tar flow spontaneously from the springs or exist in pools upon the Pacific Company's estate in notable quantities. These natural wells exist in a general east and west line, conformable to the line of the Chemical Ridge, which forms the southern boundary, and they occur at intervals over an extent of not less than four or five miles, warranting the conviction that oil wells may be bored almost anywhere in the same line, with every probability of success, which is ever found in simllar cases.

Petroleum is now sent in considerable quantities to almost every foreign port with which we have commercial relations, says the U. S. Railroad and Mining Register. Great Britain is the largest consumer of the product, the export from New York thither during last year being 6,275,000 gallons. France is next in importance, her import having been 4,625,000 gallons, a large increase upon the receipts of 1863. The shipments hence to Antwerp have also been large, amounting to 4,149,000 gallons, against 2,692,000 gallons in 1863. Bremen has imported nearly 1,000,000 gallons; Hamburg, 1,186,000 gallons; and Rotterdam, 533,000 gallons. The shipments to Cronstadt indicate a large growth in the demand in Russia, the export thither having increased from 88,000 gallons in 1863, to 400,000 gallons in 1864. The exports to Genoa, Leghorn, Trieste, Lisbon, and Australia, are also considerable.

It is stated that the San Francisco Water Company and Spring Valley Water Company are about to consolidate.

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LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.

W. S. SHERMAN, PUBLISHER.

PROF. C. ELTON BUCK, CONSULTING CHEMIST.

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AND

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PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, ... EDITOR.

THURSAY, MARCH 16, 1865.

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BACK NUMBERS WANTED.—We want to complete our files of the Journal, the following numbers, for which we are willing to pay full price.

Vol. II—No.'s 13, 22, 24, 25, 29 and 34.

Vol. III—No's 40, 42, 44, 47, 48, 52 and 56.

Vol. IV—No.'s 63, 64, 67, 68, 69, 70, 72, 74, 80, 82, 83.

Vol. V.—No.'s 91, 93, 95 and 96.

Those of our subscribers who do not bind the Journal, would do us an especial favor by forwarding to us any of the above numbers. We are being constantly called upon to furnish back issues of our paper by those who value it for future reference, and we have supplied them until all of the above numbers are exhausted.

TO OUR SUBSCRIBERS.—There are a few of our subscribers who are in arrears for the current year, and to whom we have sent bills without any response, We request all who are indebted to us to remit the amount due, either in a Bank check to our order (payable anywhere), or in a post office order payas ble here, not having received several remittance made to us in money. And if any parties remit and do not receive acknowledgement of its receipt in due time we wish them to advise us.

THE AMERICAN REPORTER.—We have received a monthly bearing the above title, and find it a publication worthy to be encouraged. Its object is to circulate such information among the working people of Great Britain as will induce a better class o laborers, skilled and unskilled, to emigrate to thi country than has heretofore been usual. It is distributed by eficient agents among all classes of British operatives and is read by them with great interest.

CHEMISTRY OF COAL.

Dr. Frankland, in the course of a series of lectures on the Chemistry of Coal at the Royal Institution, London, explained the manner in which paraffin oil and paraffin candles are extracted from coal tar, and how the beautiful colors called magenta and mauve are produced from that disagreeable looking and offensively odorous substance. The accumulation of the tar in gas works was formerly a great nuisance, as there was no known availa le mode of making use of it, but it is now considered so valuable that coal is often distilled at a low heat for the purpose of producing it, the gas being thrown away. From coal tar, chemists have separated no fewer than fifty compounds, of which three have been rendered principally useful for dyeing—benzole, phenylic alcohol, and analine. For the production of colors benzole must be converted into analine, which change is effected by heating it first with nitric acid, and then with acetic acid and scraps of iron. The color mauve is produced by heating analine with bichromate of potass and sulphuric acid; the magenta is obtained by heating analine with arsenic acid; blue and violet are produced by heating magenta with analine. Dr. Frankland produced a trayful of glasses, in which were placed small invisible particles of differently prepared substances from coal tar, and on pouring into the different glasses phenylic alcohol, they were filled with fluids of various colors, all poured from the same bottle. The following was given as a brief statistical statement of the quantity of dye obtainable from coal;—30 cwts. of coal yields 360 lbs. of tar, which furnish 18 lbs. of naptha, containing 6 lbs. of benzole; and the latter yields 5 lbs. of analine, which produce 1 lb. of magenta. One lb. of magenta will dye 650 lbs. of silk, or 900 lbs. of wool, the latter quantity being the average produce of 160 sheep. Dr. Frankland showed the process of dying cotton, silk, and wool different colors, and he exhibited several other experiments to illustrate the remarkable properties of the substances extracted from what had, until recently, been considered waste products in the manufacture of gas.

Paris has hitherto believed itself to be supplied by the water of the Seine; yet it appears, from a scientific report sent into the Academy by M. Robinet, that we drink the water of the Marne, than which, judging by experience, I should say it would be difficult to find worse. But a curious fact has been proved by M. Robinet. From Charenton to Sevres, analysis proves that the Seine, on the left bed of the river, flows on without any admixture of the waters of the Marne, which keep on the right bank, and that the two rivers only amalgamate between the bridges of Sevres and Saint Cloud. As all the water-courses are laid on from the right bank, it is clear that we are supplied by the water of the Marne. I only wish it were better. A similar phenomenon may be observed from the Pont de Bergnes, Geneva, where "the blue waters of arrowy Rhone" rush on to a considerable distance uncontaminated by the gray and sandy lake; but M. Robinet cites a still more striking instance in Siberia, where the river Yoandesi, or Angara, rushes from the Altai range into Lake Baikal. Its crystal waters foam, and give the spectator the idea of struggling against the dirty lake water—and for an immense distance the Angara rolls on clear and undefiled by Lake Baikal.

The city of Hong Kong has been lighted with gas; but it is a mistake to state, as has been done, that this is the first use of gas in China. The Chinese have long used natural jets of gas in some parts, conducting it through bamboo cane pipes to their houses.

WEIGHT OF WATER IN PIPES.

Table showing how to discover the Quantity and Weight of Water in Pipes of any given size.

Diameter in inches.	Quantity in cubic inches.	Quantity in imperial gallons.	Weight in lbs. avoirdupois.
½	14·14	0·051	0·51
1	56·55	0 205	2·05
1½	127·23	0 460	4·60
2	226·19	0·818	8·18
2½	353·43	1·278	12·78
3	508·94	1·841	18·41
3½	692·72	2·506	25·06
4	904·78	3·272	32·72
4½	1145·11	4·142	41·42
5	1413·72	5·113	51·13
5½	1710·60	6·187	61·87
6	2035·75	7·363	73·63
6½	2389·18	8·641	86·41
7	2770·88	10·022	100·22
7½	3180·86	11·505	115 05
8	3619·11	13·090	130·90
8½	4085·64	14.777	147·77
9	4580·44	16·567	165·67
9½	5103·52	18·459	184·59
10	5654·87	20·453	204·53
10½	6234·49	22·550	225·50
11	6842·39	24·748	247·48
11½	7478·56	27·049	270·49
12	8143·01	29·452	294·52

This table shows the quantity and weight of water contained in one fathom of length of pipes of different bores from one inch to twelve inches in diameter, advancing by half inch. The weight of a cubic foot of water is taken at 1000 ounces avoirdupois, and the imperial gallon at 10 lbs.

TEMPERATURE AND WEIGHT OF THE ATMOSPHERE AT VARIOUS HEIGHTS.

Height.	Temp.	Water heavier than the air.
Level of the sea,.....	60°	860 times.
One mile above,.....	43	1,083 "
Two miles above,.....	26	1,363 "
Three miles above,.....	9	1,716 "
Four miles above,.....	-8	2,160 "
Five miles above,.....	-25	7,219 "

MINING INCORPORATIONS FOR 1864.

The books of the Secretary of State, California, exhibit the following statistics of Mining incorporations formed during 1864:

Gold and silver mining companies,.....	610
Copper mining companies,.....	80
Coal mining companies,.....	5
Tin mining companies,.....	2
Quicksilver mining companies,.....	4
Salt mining companies,.....	1
Marble mining companies,.....	1
	703

Near Bagdad, in what was known to the ancients as Chaldea, stands the famous Tower of Ackerouf, a contemporary of the Tower of Babel, the bricks of which it was built honeycombed by the elements, while the bitumen that binds them remains perfectly smooth and solid. The very reeds and straw imbedded in the material are also thoroughly preserved by it. Now, our European and American asphaltum bears no comparison to this!

NEW SAFETY LAMP.—M. Alphonse Dumar shows a new safety lamp, invented by him, and which he named a phosphorescent light. Its advantages is that it gives a cold light, and it can, therefore, be used in places where the use of the Davy Lamp might be attended with danger. The light is obtained by an electrical battery, at a cost of 1d. for 10 working hours. The principle of a phosphoric light is not entirely new; stale fish has been used for the same purpose.

Parafine has been applied to certain kinds of building stone to prevent the decay to which they have been subject by continued exposure to the weather.

PETROLEUM REVIEW.

March 2.—The market for Crude has been very dull and irregular; since our last prices have had a downward tendency, and at the close are lower; sales have been made for April at 41 to 42 cts. buyers option. Refined has been in less active demand, the business being confined entirely to sales of free for home consumption; in prices we have no particular change to note; the receipts continue very light and holders are firm in their views, consequently nothing has been taken for export. The closing quotations are as follows; 43 to 44 cts. for Crude; 66 to 67 cts. for Refined in bond, and 86 to 87 cts. for do. free. A new well of 50 barrels has been struck on Sugar Creek, yielding Lubricating Oil which sells for $25 per barrel at the well.

March 3.—Petroleum is dull and lower; we quote at 41 to 42 cts. for Crude, 66 cts. for Refined in bond, and 87 cts. for do. free.

March 4,—Petroleum continues dull, we hear of no business, quotations are nominal, at 41 to 42 cts. for Crude, 66 to 67 cts. for Refined in bond, and 87 cts. for do. free.

March 6,—The market is dull and prices are heavy for Crude at 41 to 42 cts. Refined are a shade firmer; we quote at 67 to 68 cts. for bonded, and 87 to 88 cts. for do. free.

March 7,—The market is dull and prices are heavy for Crude at 41 to 42 cts. Refined are a shade firmer, we quote at 67 to 68 cts. for bonded, and 87 to 88 cts, for do. free.

March 8,—Crude has been in small supply and the business done was confined to small lots to supply the immediate wants of refiners, prices ruled steady, sales having been made at 43½ to 44 cts. but toward the close the market was heavy under larger arrivals, buyers generally held off in anticipation of a decline, we quote nominally at from 41 to 41½ cts Refined has been in less active demand, sales have fluctuated, and at the close are heavy at 67 to 68 cts. for bonded, and 87 to 88 cts. for free. Naptha has been fairly active and full previous prices were obtained, we note sales at 54 to 56 cts.

March 9,—The market is dull at 42 cts. for Crude, 67 to 68 cts. for Refined, in bond, and 87 to 88 cts. for do. free.

March 10,—Is dull and easier, sales of 250 bbls. Crude at 41 cts. sales for April at 38 to 40 cts. Refined are inactive at 65 to 67 cts. for bonded, and 85 to 87 cts. for free.

March 11,—The market continues dull, and prices favor the buyer, we quote nominally at 40 to 41 cts. for Crude, 65 cts. for Refined in bond, and 85 cts for do. free.

March 13,—Crude is inactive and lower, we quote at 39 to 40 cts. Refined is quiet and unchanged, we quote at 65 cts. for Bonded and 85 cts. for free.

March 14,—Is dull and prices are decidedly lower, we quote Crude at 37 cts Refined in bond, 62 to 63 cts. and do. free, at 82 to 83 cts

March 15,—The material decline in gold, and the continued large receipts, has had a very depressing effect on the market. For Crude prices have largely fallen off and still tend downward, yesterday there was quite a panic, the market closes to day at 35 to 36 cts. on the spot, there has been nothing of importance done for future delivery, holders offer to sell at a concession, but under the present unsettled state of affairs generally buyers hold off. Refined has also shared in the decline. Bonded at the close is offered at 58 to 60 cts. for Light Straw to White, but we hear of no sales. Free is in small supply, consequently holders were not compelled to give away, but slightly closing quiet at about 8 cts.

IMPORTANT NOTICE.

To Advertisers.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look hrough our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

NEW YORK MINING EXCHANGE.

New York, March 15, 1865.

	Bid.	Asked		Bid.	Asked
Copper Stocks.			***Gold Stocks.***		
Aztec	7⅛	9	Benton	1	1¼
Bedford	1	1⅛	Consol'd Gregory	25	28¾
Boston	4⅛	5¾	Corydon	—	8
Caledonia, A. P.	10	12	Gunnel	3¾	4¾
Canada	3¾	4	Grent Western	—	8
Carp Lake	3	5	Hope	—	9
Central	65	70	Isaac's Harbor	¾	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls	34⅛	38	Mariposa	44	44¾
Clifton	—	81	Montana	⅛	1
Dacotah	—	5¾	New York	2⅛	3
Derby	⅞	1⅛	N. Y. & Nova Scotia	⅛	1¼
Douglass	—	—	Quartz Hill	9¾	10
Evergreen	18¾	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13⅛	Rocky Mountain	—	10⅛
Frue	2¾	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	12¾	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	82	83	Cumberland	61	62
Indiana	8¾	9¾	Del. & Hud. Canal	206	208
Isle Royale	20	20⅝	*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	⅝	¾
Mendota	—	—	Clute	1⅝	1⅞
Merrimac	4¾	5⅝	Erie	—	20
Minnesota	33	37	Macomb	3¾	5
New York, A. P.	2	3⅛	Plancentia Bay	1¾	1⅞
N. J. Consolidated	4	4⅜	Sussex	⅝	¾
Norwich	—	6	Wallkill	3¾	6
Ogima	5	6¾			
Outonagon	3	4⅛	***Iron Stocks.***		
Penn	—	11⅝	Copake	8	10
Providence	1⅜	2	French Creek	⅞	1
Quincy	96⅛	98	Teal Lake	4⅛	6
Reliance	1⅛	2¾			
Rockland	12⅛	14	***Miscellaneous.***		
Superior	8⅝	9	Rutland Marble	17	20
Sharon Consolidated	—	5	* *Ex. div.*		

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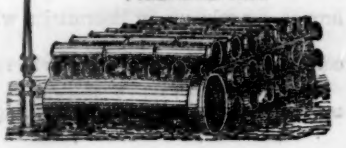

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IT IS THE ONLY RELIABLE
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No Wood-work to Swell or Split. No Thumb-screws to get out of order. Warranted with or without Cog wheels.

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That Iron well galvanized *will not rust.*
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We might fill the paper with testimonials, but insert only a few to convince the skeptical, such there be; and we say to all, *test* Putnam Wringer. Test it *thoroughly* with *any* and *all* others, and if not entirely satisfactory, return it

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,
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Has all the flavor of OLD GOVERNMENT JAVA, and is but half the price; and also that

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These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

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"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

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"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'West's Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly at work, 24 hours of each day (save Sundays), and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

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Chilled and Wrought Iron Safes,

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LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought Iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually protected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is an important advantage gained to the purchaser, as Safes often rust out and become worthless in two or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS

	Outside.			Inside.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.

LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

OUTSIDE.				INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54½	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42½	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31½	27½	15	350

Single Doors and M. Lock.

6	38	35	26	27⅞	23½	15	$250
7	34	31	26	24	21	14	200
8	31	28	24	21	18	18	175
9	30	24	24	21	15	12	140
10	26	22	22	19½	13½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES.

SIDE BOARD		$600
DINING ROOM		350
PANTRY (No. 1)		275
PANTRY (No. 2)		150
DUODECAGON BANK LOCK		100
MONITOR SAFE	do.	50
SAFE	do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

OUTSIDE.				INSIDE.			
No.	Height.			Hei	Width.	Depth.	Price.
	In.			In.	In.	In.	
1	68			55	39	18	$1,200
2	61			48	39	18	1,050
3	57			42½	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	48	20	$1,000
0½	61	53	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	53	32	26	49	28		
3	42	36	22	38	32	19	00
4	36	31	20	32	27		
5	30	24	18	26	20	14	

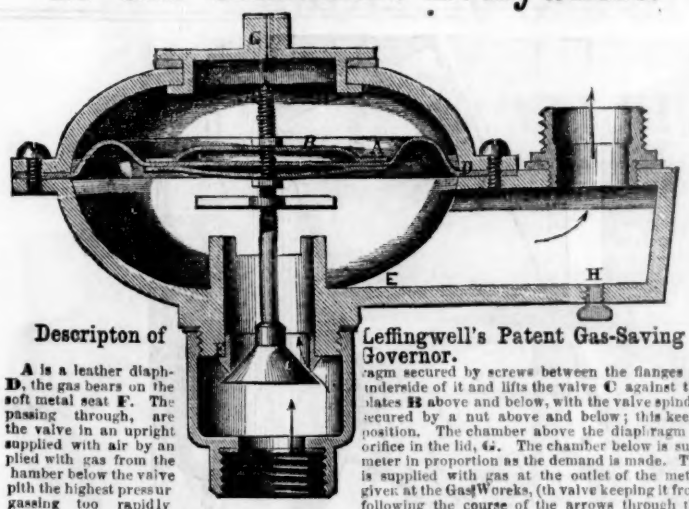
BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjustable.	Price.	Weight.
	In.	In.	In.		
1	72	27	20	$400	3,000
2	72	27	20	275	1,500

Orders received and filled at net cash prices, by the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York. All Safes shipped from Troy free of cartage.

Business Depart., E. ALVORD. *Corresponding Depart.*, FOWLER AND WE

To Gas Consumers Everywhere.



Descripton of Leffingwell's Patent Gas-Saving Governor.

A is a leather diaph- ragm secured by screws between the flanges at **D**, the gas bears on the underside of it and lifts the valve **C** against the soft metal seat **F**. The plates **H** above and below, with the valve spindle passing through, are secured by a nut above and below; this keeps the valve in an upright position. The chamber above the diaphragm is supplied with air by an orifice in the lid, **G**. The chamber below is sup plied with gas from the meter in proportion as the demand is made. The hamber below the valve is supplied with gas at the outlet of the meter pith the highest pressur given at the Gas Works, (th valve keeping it from gassing too rapidly following the course of the arrows through th rovernor to the outle where the distribution pipe is connected. **E** is a chamber to catch th tip, **H** isheo said chamber, at which point, if the drip troubles its action, a syphon is tached which c o .

STURGES & FROST, (MANUFACTURERS AND PROPRIETORS FOR THE UNITED STATES OF LEFFINGWELL'S PATENT GAS-SAVING GOVERNOR,) solicit attention to the above instrumen which the cut represents. It will positively lessen your gas consumption **15 to 40 per cent** without diminishing, but greatly improving, the light, which is done entirely on scientific principles easily comprehended.

The above facts are demonstrated by thousands of consumers who have them in practical operation in different parts of the Union. By sending two three cent postage stamps to the proprietors, No. 9 Mechanic Street, Newark, N. J., the GAS CONSUMERS MANUAL will be sent, containing price of the above Governor, full information with regard to the waste of gas, its causes and how remedied, an almanac for the years of 1864-5-6 and 7; also, a diary suitable for any year, together with certificates and references of many who have the Governors in use.

Try it by all means, it will not fail you.

Each Governor is Warranted Perfect.

STURGES & FROST.

☞ As no QUICKSILVER is used, Gas Companies will find it to their interest to favor its adoption among their consumers.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Doane st., Boston.

THE
STANDARD
GoldCompany
OF COLORADO.

DIRECTORS,
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EDWARD WILLIS,
LIVINGSTON SATTERLEE,
ETHAN ALLEN,
S. A. BANKS,
SYLVESTER TAYLOR.

President, ROBERT BOWNE.
Secretary, F. A. MITCHEL.

MINES on FISK LODE,
BOBTAIL LODE,
GROUND HOG LODE,
ENTERPRISE LODE,
and others,

In all, 8,625 feet (linear), and large water powers and mill sites.

Capital issued, 40,000 shares, at $10 per share.

A limited number of shares are offered at the low SUBSCRIPTION PRICE (having been reserved for their customers), by

WILLIAMS & MITCHEL, 12 Wall Street.

SAFEST AND CHEAPEST SYSTEM OF INSURANCE.

WASHINGTON
INSURANCE COMPANY
172 BROADWAY,
Cor. Maiden Lane, NEW YORK.

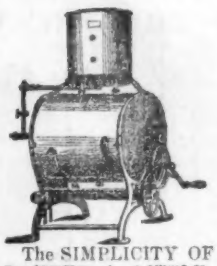
CASH CAPITAL, - - -	$400,000.
Assets, June 1, 1864, - - -	600,000.
Scrip Dividend, 1863, - -	60 per Cent.
Scrip Dividend, 1862, - -	60 per Cent.
Scrip Dividend, 1861, - -	60 per Cent.

The Policies entitled to participate receive 75 per cent. of net Profits.

Insures Buildings, Merchandise, Furniture, Rents, Leases, against loss or damage by FIRE, and MARINE RISKS on LAKES, RIVERS and CANALS.

GEO. C. SATTERLEE, President.
HENRY WESTON, Vice Prest.
WM. K. LOTHROP, Secretary.
WM. A. SCOTT, Ass't Secretary.

DRAKE'S
PATENT
AUTOMATIC GAS MACHINE.



THIS MACHINE, which has been in constant use for more than two years, is now acknowledged to be the

Most Convenient, Simple, and Efficient Method

OF LIGHTING BUILDINGS OF ALL KINDS, out of the reach of regular gas-works, ever brought to public notice.

The SIMPLICITY OF THE APPARATUS, its ENTIRE FREEDOM FROM DANGER, the LITTLE ATTENTION REQUIRED, the EASE WITH WHICH IT IS MANAGED, and THE CHEAPNESS and SUPERIORITY OF THE LIGHT, has gained for it the favorable opinion of those acquainted with its merits.

The Machine takes up but little room; no disagreeable odor is experienced in its use; no fire is applied to the apparatus at all; it can be attached to ordinary gas-pipes used for coal-gas, and is burned through the same kind of fixtures.

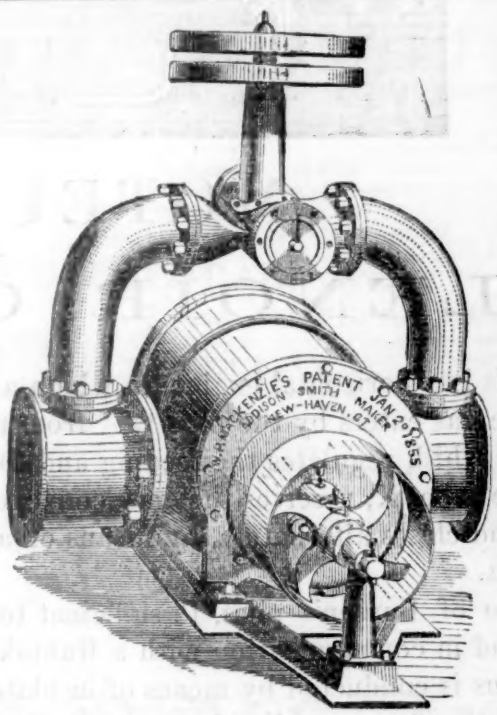
These Machines are manufactured in Boston, by the AU OMATIC GAS-MACHINE CO., and are for sale at their Store, 78 Washington s eet, Boston, and also at the Agency, MITCHELL, VANCE & CO.'s, No. 620 Broad way, New York.

For further particulars, address—

MITCHELL, VANCE & CO.,
620 BROADWAY, NEW YORK CITY.

SMITH & SAYRE,
Sole Proprietors and Manufacturers of

THE MACKENZIE PATENT GAS EXHAUSTER AND COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the pr tion and illuminating power of the gas, and add very much to the durability of the retorts, e clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, dur cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the powe required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. uel. Address SMITH & SAYRE, 458 Broadway, New York.

SATTERLEE & CO.,
BANKERS
AND
STOCK BROKERS,
49 Exchange Pce.
NEW YORK.

G. B. SATTERLEE, H. TRACY ARNOLD,
H. A. BOSTWICK, LIVINGSTON SATTERLEE.

Mining Stocks bought and sold at the Regular, Mining, Boston and Philadelphia Boards.

ALBERT H. NICOLAY,
STOCK BROKER AND
AUCTIONEER,
No. 52 William Street,
NEAR WALL ST., NEW YORK.
Special attention given to the Buying and Selling of Gas-Light Companies' Stocks.

PARTICIPATION.
ÆTNA FIRE INS.
COMPANY OF NEW YORK,
NO. *170* BROADWAY.

CASH CAPITAL,	CHARTERED
$200,000.	1824.

The insured receive seventy-five per cent. of the net profits annually, without incurring any liability. When preferred, a discount will be made in lieu of participation in profits.

Scrip Dividend of 1861, - - 50 per cent.
Scrip Dividend of 1862, - - 50 per cent.
Scrip Dividend of 1863, - - 50 per cent.

JACOB BROUWER, *President.*
H. C. BEACH, *Secretary.*
WM. BARBOUR, *Asst. Sec.*

Glycerin for Gas Meters.

This article is superior to any fluid ever before used for Wet Meters, and we cannot better set forth its advantages than by giving the following letter from the Superintendent of the Covington Gas Co. The superiority of our Glycerin over all others in the market, for this purpose, is admitted by every Company that has used it. We have sold, the past winter, to the Cincinnati Gas-Light and Coke Co.; to the Gas Companies of Covington, Ky.; Dayton, Springfield, Portsmouth, Urbana, and Piqua, Ohio Richmond, Ind., and Buffalo, N. Y., to whom we refer.

Glycerin is much cheaper than Whisky is now, or likely to be areafter, and not evaporating, greatly increases the economy of s use.

OFFICE OF THE COVINGTON GAS-LIGHT CO,
COVINGTON, KY., Feb. 18, 1864.

MESSRS. W. J. M. GORDON & CO.:

Dear Sirs,—It affords us great pleasure in testifying to the superiority of the Glycerin Fluid purchased from you for filling the Wet Meters now in use by the Covington Gas-Light Company.

The difficulty of finding a non-evaporating and anti-freezing mixture for Wet Meters, has, in my opinion, been overcome by the use of your Glycerin Fluid.

I have had it in constant use for the past four months, and during that period the thermometer has ranged as low as 14o below zero, and after careful examination, I have found the fluid in the same condition as when first put in the Meters, and without the slightest discoloration.

Its non-evaporating quality does away with the hitherto unavoidable expense of filling the Meters monthly, and renders Wet Meters no longer objectionable.

In fact, I can cheerfully recommend it as being cheaper and better than any other Fluid or Mixture now in use.

Very respectfully,
S. S. STRATTON, *Sup't Cov. Gas Co.*

We have been engaged in Manufacturing Glycerin the past six years, and from our advantage in material and the large amount we make, are enabled to offer it lower than any manufacturer in this country. We will be pleased to quote prices or to give further information.

W. J. M. GORDON & BRO.,
MANUFACTURING
CHEMISTS & DRUGGISTS,
N. E. Cor. Central Avenue & Eighth St.,
Laboratory, Miami Canal, bet. Third & Fifth Sts.,
CINCINNATI, O.

ATLAS
OF THE
OIL REGIONS.

The extraordinary developments of the last few years have rendered indispensable to the community, A NEW and RELIABLE map of that portion of Pennsylvania, known as the OIL REGIONS. And such a Map, in the form of an Atlas, made from actual surveys of the whole territory (and the only surveys that have been made in the territory,) is now being prepared for publication by the undersigned, to which your special attention is invited. In will embrace the whole of VENANGO and portions of CRAWFORD and WARREN Counties, and is designed to be the most complete and perfect work of the kind ever published, showing distinctly—

1 A general map of Venango and parts of Warren and Crawford counties, Penn., and enlarged plans of each township.

2 All the original lot lines.

3 All subsequent subdivisions of lots in the oil districts, with the names of present owners or lessees.

4 All the Roads, Rivers and Creeks accurately delineated.

5 All Dwellings, Factories, Mills, Refineries, and Shops of every description.

6 Enlarged plans of all important Towns and Villages.

7 Enlarged plans of all the oil lands on Aleghany River, Oil Creek, French, Pithole, Tionesta, Hemlock and Tidioute Creeks, Cherry and Cherry Tree Runs, and all other Creeks and Runs on which discoveries o oil have been made.

8 Location and brief description of the property of all the principal Oil Companies.

9 Location and names of all the Oil Wells in the Territory.

10 A brief history of the Oil Business, from its first discovery to the present time, with valuable statistical information, making a volume of some fifty pages, about 15x18 inches, substantially bound.

A limited number of business cards pertaining to the production or sale of oil, or oil territory, will be received, and if early application be made, parties may have views of their establishments, or wells, with brief notices of the same, inserted.

The surveys for the Atlas are completed, and the proprietors intend to have it ready for delivery to subscribers (only) by about the 1st of January next.

All persons or firms desiring the work are requested to send their names as subscribers to the undersigned before the 1st of December, and designate the number of copies wanted, and the place where they wish them delivered.

F. W. BEERS & CO
43 John St., New York,
or Franklin, Penn.

Franklin, Penn, Oct. 20, 1864.

New York, April 18th, 1864.

* * * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation*, for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage,

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

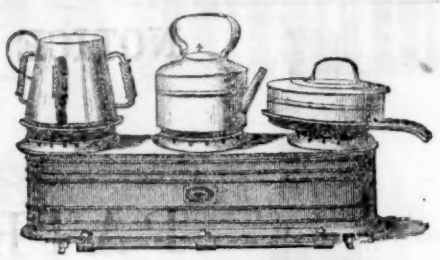
DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co., Sole Proprietors.
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants of an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitters, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy o keep in the house.—*New York Weekly Day Book.*



Cooking & Heating
BY GAS.

CHEAPRR THAN COAL OR WOOD.

The "EAGLE" Gas Heating
STOVES,

Positively guaranteed free from Smoke or Smell.

Will Heat Offices, Parlor, Dining, Sleeping, and Bath Rooms. Also,

The EAGLE Gas Cooking
STOVES & RANGES,

Will BOIL, BROIL, ROAST, BAKE, TOAST,

STEW, and HEAT IRONS

The EAGLE GAS STOVES and RANGES have been in use for over Three years, and are found to be the most SIMPLE, COMPLETE and PERFECT Arrangment for HEATING and COOKING, in every respect ever invented, and to do the Work with LESS TROUBLE, in LESS TIME and at LESS EXPENSE than any Coal or Wood stove.

Their WONDERFUL NEATNESS, CONVENIENCE and ECONOMY can be seen at a glance.

WE ALSO MANUFACTURE

COAL OIL STOVES,
For Cooking and Heating.

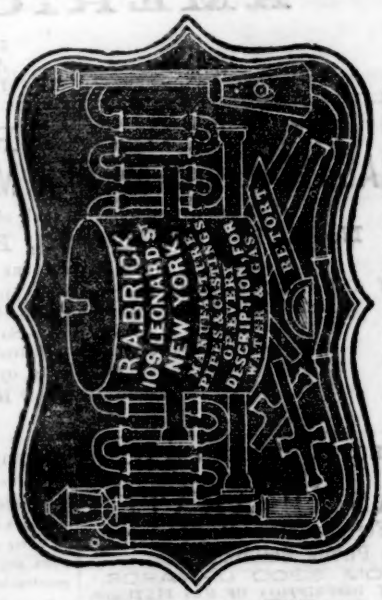
The American Advertising agency 389 Broadway, N. Y. Bus. Dept., E. Alvord, cor. Dept., Fowler & Wells, receive orders for our stoves.

EAGLE GAS STOVE MANUFACTURING CO.
No. 474 BROADWAY, N. Y.

☞ The Company have descriptive Catalogues, which will be sent or delivered, upon application for them.

PIPES AND CASTINGS,

BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

OF EVERY DESCRIPTION.